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A NEW SPECIES OF POLYCHAETE, *SCOLELEPIS ANAKENAE* (POLYCHAETA: SPIONIDAE) FROM EASTER ISLAND, SOUTH PACIFIC OCEAN, WITH ECOLOGICAL COMMENTS

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Abstract.—A new species of Spionidae, *Scolelepis anakenae* from Easter Island, is described. *Scolelepis anakenae,* which closely resembles *Scolelepis chilensis* (Hartmann-Schröder) from the coast of Chile was the only polychaete species found in sand at Anakena beach during a macrofaunistic study. Comments about its distribution and population density in the intertidal zone are included.

Easter Island, Rapa Nui in the native language, is one of the most isolated points in the southeast Pacific Ocean (27°07′S, 109°22′W) and the easternmost outpost of the Indo-Pacific Region. It lies 2230 miles from South America; the nearest land to the west is the uninhabited atoll Ducie Island, 1250 miles away, and Pitcairn Island of the Tuamotu Archipelago, 290 miles farther west. Its marine fauna is of the highest biogeographic and evolutionary interest because of the remarkable degree of endemism of its shore fauna at the specific level considering that the island is not only very young (2.5 million years), but rather small, with an area of approximately 118 km^2 (Newman & Foster 1983).

Recently, Castilla & Rozbaczylo (1987) prepared a bibliographic review on the littoral marine invertebrate fauna of Easter Island. The polychaete fauna is only partially known. The papers of Chamberlin (1919), Fauvel (1936), and Kohn & Lloyd (1973) include most of the records from the island. About 60 species of polychaetes are known to occur intertidally on Easter Island. Most of them inhabit rocky shores, since the coastline of the island is formed by volcanic rocks with just a few sandy beaches. Hitherto, no research has been done on the polychaete fauna of the island's sandy beaches. On Anakena, one of the two principal sandy beaches on the island, the macrofauna was sampled quantitatively along a perpendicular sea transect. Among the specimens collected, a new and undescribed species of spionid of the genus *Scolelepis* was found. This increases the known species of spionid polychaetes on Easter Island to three, since *Prionospio* (*Minuspio*) *cirrifera* (Wirén) and *Tripolydora spinosa* Woodwick, were the only species previously known (Rozbaczylo 1985). The new species is described and ecological comments on its distribution and population density are included.

Type specimens have been deposited in the Museo Nacional de Historia Natural, Santiago (MNHN); Sala de Sistemática, Laboratorio de Zoología, Pontificia Universidad Católica de Chile, Santiago (SSUC); the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM); and in the personal reference collection of the first author (NR).

Materials and methods.—Samples were collected on 16 Oct 1982 at Anakena beach (27°04′S, 109°20′W) during an expedition sponsored by the Tinker Foundation and the Pontificia Universidad Católica de Chile through the Project "The Chilean Oceanic Islands: Our Knowledge and Future Needs"

(Las Islas Oceánicas Chilenas: Nuestro Conocimiento y Necesidades Futuras). Two transects perpendicular to the sea front were laid on the eastern portion of the beach, 22 and 28 m long, extending from the top part of the berm down to the lower intertidal limit at low tide. The profile of the beach was determined according to the method of Emery (1961) and its slope was 1:20 m. Low tide (0.23 cm) occurred at 10.30 AM. Sampling stations were set every 4 meters along the transects. The samples, 0.1 m^2, were taken at each station using a square iron sampler of 31.6 cm, open at both ends, and introduced to a depth of 20 cm in the sand. The sand was removed with a spade and sieved through a 1.5 mm mesh screen. Samples were washed in sea water and the macrofauna retained in the mesh was fixed in 10% formalin, then transferred to 70% alcohol; polychaetes were preserved in 70% ethanol with glycerine added. No analysis of the sand was made. The density of polychaetes at each level was expressed as numbers per square meter, by extrapolating from the data obtained with the sampler. Scanning Electron Microscope (SEM) observations were made with a JEOL-25 II. Photographs and drawings of the new species were executed by the first author. Figures were prepared by means of a drawing tube on a Wild M-5 microscope.

Scolelepis anakenae, new species
Figs. 1, 2

Material examined.—Easter Island, Anakena Bay, 27°04'S, 109°20'W, along a transect in the intertidal zone, 16 Oct 1982, J. C. Castilla, coll. (numerous specimens); 7 Mar 1984, J. C. Castilla, coll., holotype (MNHM 80009); paratype (MNHN 80010); 62 specimens (SSUC 6481); 41 specimens (USNM 104937).

Diagnosis.—Body wider anteriorly, flattened dorsoventrally, with short segments; posterior region subcylindrical, with longer segments. Prostomium pointed anteriorly, extending posteriorly as cephalic ridge to anterior margin of setiger one; 2 pairs of eyes. Peristomium with low lateral wings partially surrounding prostomium and forming ventral ruffled surface; palps extending posteriorly to setiger 20–30. Parapodia biramous throughout, with ciliated sensory organs between rami. Cirriform branchiae beginning on setiger 2, partially fused with notopodial lamellae, with subterminal enlargements forming knobbed tips. Anterior neuropodial lamellae entire and rounded up to setiger 34–40; in posterior segments completely divided into elongated, thickened interramal lamellae and conical ventral lobe. Anterior notosetae and neurosetae all winged capillaries; bidentate neuropodial hooded hooks from setiger 35–37 to end of body; without notopodial hooks. Pygidium forming thick cushionlike pad.

Description.—Color in alcohol light tan or pale brownish. One of largest specimens 36 mm long, 2 mm wide, with 120 setigers; one of smallest individuals 18 mm long, 1.2 mm wide, with 86 setigers; maximum body width reached approximately at setiger 20. Body distinctly divided into 2 regions: fusiform anterior region with segments rather flattened and rectangular in cross section; posterior region of numerous more or less rounded segments; segments from anterior region shorter than those from posterior region; change from one region to other marked by appearance of neuropodial hooded hooks and modifications in parapodial structure and setal distribution.

Prostomium pointed anteriorly, wider subterminally, and extending posteriorly as cephalic ridge to anterior margin of setiger 1 (Fig. 1a). Two pairs of dark eyes in nearly straight transverse row, located on each side of thickened part of prostomial ridge, just behind slight depression at beginning of ridge; dorsal pair more or less rounded, ventral pair oval.

Peristomium well developed, with low lateral wings, partially encompassing prostomium and forming ventral ruffled surface (Fig. 1b). Short, eversible, somewhat

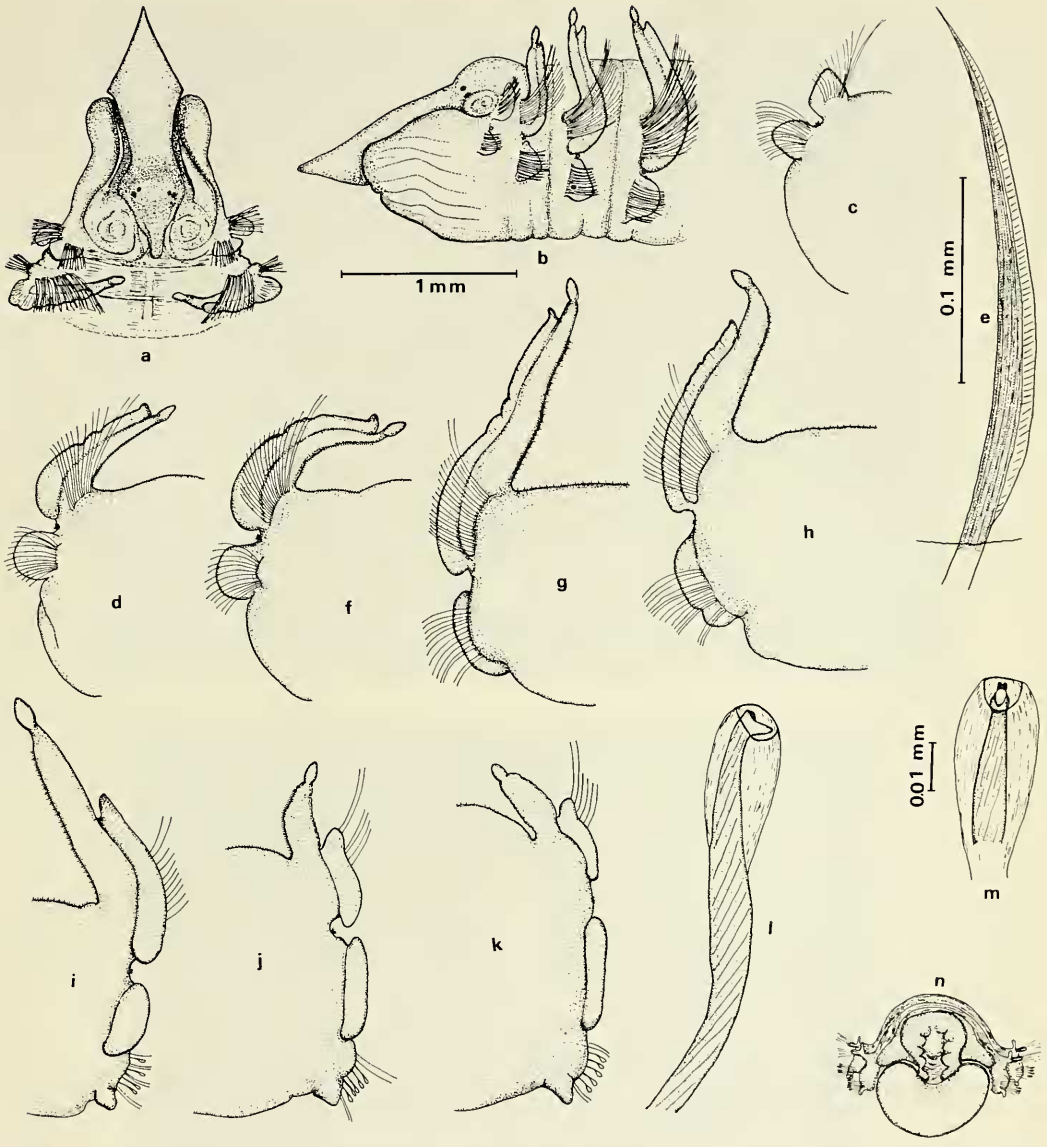

Fig. 1. *Scolelepis anakenae*: a, Anterior end, dorsal view, palps omitted; b, Same, lateral view; c, Setiger 1, anterior view; d, Setiger 2, anterior view; e, Capillary notoseta from anterior row of setiger 7 (third from top); f, Setiger 3, anterior view; g, Setiger 14, anterior view; h, Setiger 32, anterior view; i, Setiger 36, posterior view; j, Setiger 76, posterior view; k, Setiger 114, posterior view; l, Neuropodial hooded hook from posterior parapodium, lateral view; m, Same, frontal view; n, Posterior end of body, dorsal view. Scale under b applies to a–d, f–k, n.

lobulated proboscideal region. Palps thickened basally, tapering gradually, with conspicuous basal sheath or palpophore; when extended posteriorly palps reaching setiger 20–30.

Parapodia biramous throughout. First setiger smallest, although well developed, with lamellae of almost same size; notopodial lamellae more or less triangular while neuropodial more rounded (Fig. 1c). All para-

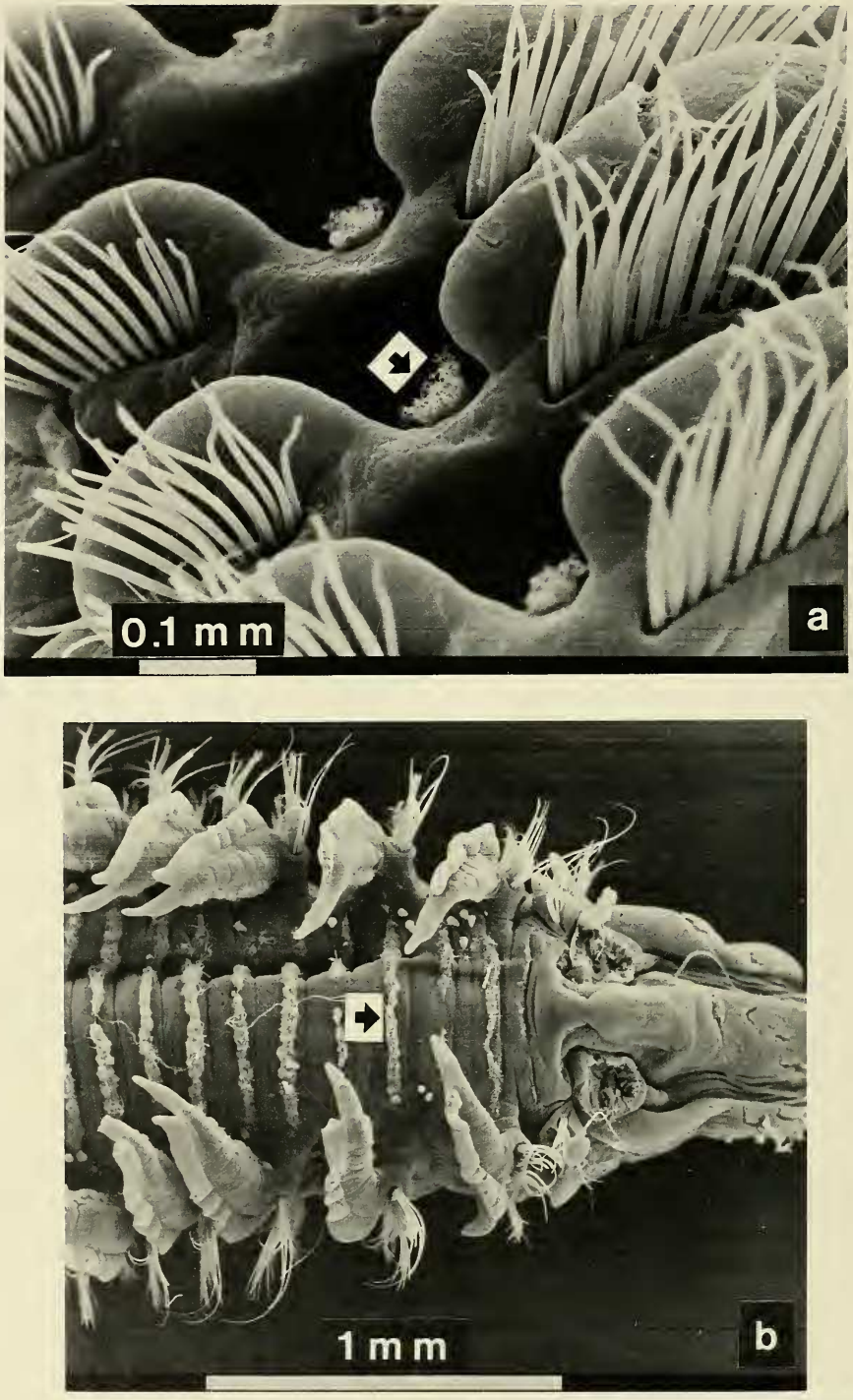

Fig. 2. *Scolelepis anakenae,* scanning electron micrographs: a, Anterior parapodium showing ciliated sensory organs between rami (arrow); b, Anterior end, dorsal view, showing ciliated bands across dorsum (arrow).

podia with ciliated sensory organs between rami, more conspicuous in specimens preserved in formalin than when transferred to alcohol (Fig. 2a, arrow).

Branchiae beginning on setiger 2, fused to notopodial lamellae, being free only at their tips, with distinct subterminal enlargements forming knobbed tips (Fig. 1d). Branchial pairs connected across dorsum by narrow ciliated ridge, rather difficult to see with light microscopy but evident with SEM (Fig. 2b, arrow). Notopodial lamellae fused to branchiae except distally in more anterior setigers, becoming more separated posteriorly and retaining only basal fusions in far posterior setigers (Fig. 1k); free margin of notopodial lamellae folded.

Anterior notosetae and neurosetae all winged capillaries, similar in structure, with shafts bearing fine granulations along internal striations and transparent sheaths with fine striations (Fig. 1e). Notosetae arranged in 2 rows in anterior setigers and single rows more posteriorly. Each row in anterior setigers forming fan-shaped fascicle of 13–15 setae per ramus, with 3–4 longer ones in superior position; setae of each row almost of same length, being shorter in anterior row than in posterior row. Median and posterior setigers with only 4–7 notosetae, with striated shafts but without granulations.

Postsetal neuropodial lamellae more or less rounded on first 5–6 setigers (Fig. 1c–f), being just slightly longer than wide, increasing in size and becoming broadly rounded in following setigers (Fig. 1g). Neuropodial lamellae entire up to setigers 31–40, then developing slight notch (Fig. 1h) and becoming deeper in following few setigers, and then becoming completely divided into rounded dorsal and conical ventral lobes (Fig. 1i). Neuropodial lobes becoming more prolonged vertically and further separated forming elongated thickened interramal lamellae and small conical ventral lobe (Fig. 1j, k). Neurosetae on anterior setigers all capillaries in 2 transverse rows, similar in arrangement and structure to notosetae, numbering about 12 setae per row with 3–4 slender setae, slightly separated from remainder, appearing like small ventral fascicle. Neuropodial hooded hooks beginning on setiger 35–37 and continuing up to end of body. Neuropodial fascicles in single rows, typically with 5–8 hooded hooks and 2–4 capillary setae in dorsal and ventral position, dorsal ones with striated shafts but without granulations, ventral ones with shafts coarsely granulated. Hooded hooks bidentate, with apical tooth formed by 2 incompletely separated teeth fused by ridge (Fig. 1l–m).

Pygidium with ventral cushion (Fig. 1n), with single achaetous preanal segment. Anus dorsal, surrounded by crenulate margin.

Distribution.—Known only from type locality, Anakena Bay (27°04′S, 109°20′W), north coast of Easter Island, intertidal zone, sandy beach.

Etymology.—The specific epithet is taken from the type locality, Anakena Bay where, according to tradition, King Hotu Matu'a and his followers from some region located in the east or northeast of Polynesia arrived as settlers on the island.

Remarks.—*Scolelepis anakenae* is closely related to *S. chilensis* (Hartmann-Schröder, 1962) from the coast of Chile in that the apical teeth of the hooded hooks are fused by a ridge, as clearly shown by Blake (1983, fig. 2K–L). It differs from *S. chilensis* in having conspicuous ciliated sensory organs between rami in all parapodia and by the total absence of notopodial hooded hooks. In *S. chilensis,* neuropodial hooded hooks begin on setiger 25–32, while in *S. anakenae* they begin more posteriorly, around setiger 35–37. Further, the SEM reveals significant differences in the ciliated bands across the dorsum between *S. anakenae,* which are narrow, and *S. chilensis* with wide and dense bands. In *S. anakenae,* the branchiae show conspicuous subterminal enlargements forming knobbed tips; this character has not been mentioned for *S. chilensis* either in Hartmann-Schröder's original description

or by Blake (1983) in a recent revision of the species.

Ecological notes.—*Scolelepis anakenae* was the only polychaete found in the sandy beach transects at Anakena during this study. According to its macrofaunal components, the beach can be characterized by three fringes. The upper fringe, extending 8–10 m down from the berm, is very poor in macrofauna with only a single species of isopod and *S. anakenae* in very low densities, up to 10/m^2 towards the lower portion of the fringe. The middle fringe extends down for 8 m more and *S. anakenae* is the only species present, with maximum densities ranging between 460–180/m^2 at the lower border, and 260–70/m^2 at the upper border. The lower fringe encompasses the infralittoral sector of the beach, characterized by several species, including gastropods, sipunculans, and hippidean crustaceans; *S. anakenae* was found in low densities of about 20/m^2.

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